

# Rangeland Ecology & Management

## Table of Contents

### Volume 60, 2007

#### JANUARY 2007

##### Research Articles

- 1 Integrated Ecological and Economic Analysis of Ranch Management Systems: An Example From South Central Florida by Hilary M. Swain, Patrick J. Bohlen, Kenneth L. Campbell, Laurent O. Lollis, and Alan D. Steinman
- 12 Integrating Ranch Forage Production, Cattle Performance, and Economics in Ranch Management Systems for Southern Florida by J. D. Arthington, F. M. Roka, J. J. Mullahey, S. W. Coleman, R. M. Muchovaj, L. O. Lollis, and D. Hitchcock
- 19 Soil Phosphorus, Cattle Stocking Rates, and Water Quality in Subtropical Pastures in Florida, USA by John C. Capece, Kenneth L. Campbell, Patrick J. Bohlen, Donald A. Graetz, and Kenneth M. Portier
- 31 Effects of Cattle Stocking Rates on Nematode Communities in South Florida by Robert McSorley and George W. Tanner
- 36 Potential Outcomes and Consequence of a Proposed Grazing Permit Buyout Program by Mark S. Steinbach and Jack Ward Thomas
- 45 Utilizing Remote Sensing and GIS to Detect Prairie Dog Colonies by Timothy J. Assal and Jeffrey A. Lockwood
- 54 Evaluation of Low-Moisture Blocks and Conventional Dry Mixes for Supplementing Minerals and Modifying Cattle Grazing Patterns by Derek W. Bailey and G. Robert Welling
- 65 Diet Composition of Cattle Grazing Sandhills Range During Spring by Jerry D. Volesky, Walter H. Schacht, Patrick E. Reece, and Timothy J. Vaughn
- 71 Livestock Forage Conditioning Among Six Northern Great Basin Grasses by Dave Ganskopp, Lisa Aguilera, and Marty Vavra
- 79 Soil Water Content Dynamics Along a Range Condition Gradient in a Shortgrass Steppe by Eduardo Medina-Roldán, J. Túlio Arredondo Moreno, Edmundo García Moya, and F. Martín Huerta Martínez
- 88 Influence of 90 Years of Protection From Grazing on Plant and Soil Processes in the Subalpine of the Wasatch Plateau, USA by Richard A. Gill
- 99 Seed Shatter Dates of Antelope Bitterbrush in Oregon by G. R. Johnson and Paul C. Berrang

##### Research Notes

- 104 Monoterpene Production in Redberry Juniper Foliage Following Fire by E. S. Campbell and C. A. Taylor, Jr.
- 110 Brangus Cow-Calf Performance Under Two Stocking Levels on Chihuahuan Desert Rangeland by Milt Thomas, Jerry Hawkes, Godfrey Khumalo, and Jerry L. Holechek

#### MARCH 2007

##### Research Articles

- 115 Spatial Patterns of Pinyon-Juniper Woodland Expansion in Central Nevada by Peter J. Weisberg, Emanuele Lingua, and Rekha B. Pillai
- 125 Assessment of Expert Opinion: Seasonal Sheep Preference and Plant Response to Grazing by Meg L. Pollock, Colin J. Legg, John P. Holland, and Chris M. Theobald
- 136 Forest Service Grazing Permittee Perceptions of the Endangered Species Act in Southeastern Arizona by Julie Lorton Conley, Maria E. Fernandez-Gimenez, George B. Ruyle, and Mark Brunson
- 146 Using Weather Data to Explain Herbage Yield on Three Great Plains Plant Communities by Alexander J. Smart, Barry H. Dunn, Patricia S. Johnson, Lan Xu, and Roger N. Gates
- 154 Texas Wintergrass and Buffalograss Response to Seasonal Fires and Clipping by R. James Ansley and Michael J. Castellano
- 165 Long-Term Vegetation Productivity and Trend Under Two Stocking Levels on Chihuahuan Desert Rangeland by Godfrey Khumalo, Jerry Holechek, Milt Thomas, and Francisco Molinar

- 172 Influence of Forest Management and Previous Herbivory on Cattle Diets by Kenric J. Walburger, Timothy DelCurto, and Martin Vavra

- 179 Effects of Wildlife on Cattle Diets in Laikipia Rangeland, Kenya by Wilfred O. Odadi, Truman P. Young, and J. B. Okeyo-Owuor

##### Research Notes

- 186 Blackland Tallgrass Prairie Vegetation Dynamics Following Cessation of Herbicide Application by Karen R. Hickman and Justin D. Derner
- 191 Differences in Food Ingestion and Digestion Among Sheep Classified as High or Low Sagebrush Consumers by M. J. Fraker-Marble, K. L. Launchbaugh, and J. W. Walker
- 195 Learning Through Foraging Consequences: A Mechanism of Feeding Niche Separation in Sympatric Ruminants by Scott L. Kronberg and John W. Walker
- 199 The Influence of Gap Size on Sagebrush Cover Estimates With the Use of Line Intercept Technique by Chad S. Boyd, Jon D. Bates, and Rick F. Miller
- 203 Technical Note
- 203 A Passive Application Watering System for Rangeland Plots by Patrick E. Reece, Ann E. Koehler, W. Douglas Whisenhunt, Jerry D. Volesky, and Walter H. Schacht

#### MAY 2007

##### Research Articles

- 209 A Method for Landscape-Scale Vegetation Assessment: Application to Great Basin Rangeland Ecosystems by Tara A. Forbis, Louis Provencher, Lee Turner, Gary Medlyn, Julie Thompson, and Gina Jones
- 218 Landscape Factors Influencing the Abundance and Dominance of the Invasive Plant *Potentilla recta* by Bryan A. Endress, Bridgett J. Naylor, Catherine G. Parks, and Steven R. Radosevich
- 225 Key Attributes Influence the Performance of Local Weed Management Programs in the Southwest United States by Mary E. Hershdorfer, Maria E. Fernandez-Gimenez, and Larry D. Howery
- 235 Cheatgrass Invasion in Salt Desert Shrublands: Benefits of Postfire Reclamation by Brad D. Jessop and Val Jo Anderson
- 244 Prickly Pear Cactus Responses to Summer and Winter Fires by R. James Ansley and Michael J. Castellano
- 253 Is Altering Grazing Selectivity of Invasive Forage Species With Patch Burning More Effective Than Herbicide Treatments? by D. Chad Cummings, Samuel D. Fuhlendorf, and David M. Engle
- 261 Recovery of Big Sagebrush Following Fire in Southwest Montana by Peter Lesica, Stephen V. Cooper, and Greg Kudray
- 270 Grazing-Induced Modifications to Peak Standing Crop in Northern Mixed-Grass Prairie by Justin D. Derner and Richard H. Hart
- 277 Habitat Effects on Condition of Doe Mule Deer in Arid Mixed Woodland-Grassland by Louis C. Bender, Laurie A. Lomas, and Tomas Kamienski
- 285 Runoff and Erosion After Cutting Western Juniper by Frederick B. Pierson, Jon D. Bates, Tony J. Svejcar, and Stuart P. Hardegree
- 293 Cattle Grazing Effects on Macroinvertebrates in an Oregon Mountain Stream by James D. McIver and Michael L. McInnis
- 304 Influence of Plant Functional Group Removal on Inorganic Soil Nitrogen Concentrations in Native Grasslands by Kirk W. Davies, Monica L. Pokorny, Roger L. Sheley, and Jeremy J. James
- 311 Effects of Forage Management on Pasture Productivity and Phosphorus Content by M. M. Haan, J. R. Russell, J. L. Kovar, W. J. Powers, and J. L. Benning

##### Research Note

- 319 Wildlife Responses to Vegetation Height Management in Cool-Season Grasslands by Brian E. Washburn and Thomas JV. Seamans

*Forum*

- 324 Standardized Ecological Classification for Mesoscale Mapping in the Southwestern United States by Patrick J. Comer and Keith A. Schulz

JULY 2007

*Research Articles*

- 339 Social Associations and Dominance of Individuals in Small Herds of Cattle by Norman R. Harris, Douglas E. Johnson, Neil K. McDougald, and Melvin R. George

- 350 GPS Error in Studies Addressing Animal Movements and Activities by David C. Ganskopp and Dustin D. Johnson

- 359 Remote Sensing and the Rancher: Linking Rancher Perception and Remote Sensing by Rex J. Rowley, Kevin P. Price, and Jude H. Kastens

- 369 Costs and Losses Imposed on California Ranchers by Yellow Starthistle by Alison J. Eagle, Mark E. Eiswerth, Wayne S. Johnson, Steve E. Schoenig, and G. Cornelis van Kooten

- 378 Revegetating Russian Knapweed (*Acroptilon repens*) Infestations Using Morphologically Diverse Species and Seedbed Preparation by Jane M. Mangold, Clare L. Poulsen, and Michael F. Carpinelli

- 386 Postfire Invasion Potential of Rush Skeletonweed (*Chondrilla juncea*) by Cecilia Lynn Kinter, Brian A. Mealor, Nancy L. Shaw, and Ann L. Hild

- 395 A Basis for Relative Growth Rate Differences Between Native and Invasive Forb Seedlings by Jeremy J. James and Rebecca E. Drenovsky

- 401 Seed Germination Strategies of *Desmostachya bipinnata*: A Fodder Crop for Saline Soils by Salman Gulzar, M. A. Khan, and Xiaojing Liu

- 408 Mapping Mesquite (*Prosopis*) Distribution and Density Using Visual Aerial Surveys by Rick D. van Klinken, Damian Shepherd, Rob Parr, Todd P. Robinson, and Linda Anderson

- 417 The Spatial Patterns of Functional Groups and Successional Direction in a Coastal Dune Community by Rusty A. Feagin and X. Ben Wu

- 426 Optimal Sampling Designs for Monitoring Plant Frequency by John S. Heywood and Michael D. DeBacker

*Forum*

- 435 Grazing Land Reform in New Zealand: Background, Mechanics, and Results by Ann Brower

*Research Note*

- 441 Toxic Alkaloid Concentrations in *Delphinium nuttallianum*, *D. andersonii*, and *D. geyeri* in the Intermountain Region by Dale R. Gardner and James A. Pfister

*Technical Note*

- 447 Number of Samples Required for Estimating Herbaceous Biomass by Michio Tsutsumi, Shiro Itano, and Masae Shiomi

SEPTEMBER 2007

*Research Articles*

- 453 Successional Transitions and Management of a Phosphorus-Limited Shrubland Ecosystem by Zalmen Henkin, No'am G. Seligman, and Immanuel Noy-Meir

- 464 Ecosystem Water Use Efficiency in a Semiarid Shrubland and Grassland Community by William E. Emmerich

- 471 Effect of Phosphate Fertilization on Flooding Pampa Grasslands (Argentina) by Adriana M. Rodriguez, Elizabeth J. Jacobo, Pablo Scardaoni, and Victor A. Deregbus

- 479 Grazing and Burning Japanese Brome (*Bromus japonicus*) on Mixed Grass Rangelands by K. R. Harmoney

- 487 Decreasing Forage Allowance Can Force Cattle to Graze Broom Snakeweed (*Gutierrezia sarothrae*) as a Potential Biological Control by Michael H. Ralphs, Randy D. Wiedmeier, and Jeffrey E. Banks

- 498 Bluebunch Wheatgrass Response to Spring Defoliation on Foothill Rangeland by Tracy K. Brewer, Jeffrey C. Mosley, Daniel E. Lucas, and Lisa R. Schmidt

- 508 Effects of Fire Frequency and Intensity on Mesquite in an Arizona Grassland by Carl E. Bock, Linda Kennedy, Jane H. Bock, and Zach F. Jones

- 515 Short-Term Effects of Burning Wyoming Big Sagebrush Steppe in Southeast Oregon by Kirk W. Davies, Jonathan D. Bates, and Richard F. Miller

523 Large-Scale Aerial Images Capture Details of Invasive Plant Populations

by Dana Blumenthal, D. Terrence Booth, Samuel E. Cox, and Cara E. Ferrier

*Research Notes*

- 529 A Fence Design for Excluding Elk Without Impeding Other Wildlife by Kurt C. VerCauteren, Nathan W. Seward, Michael J. Lavelle, Justin W. Fisher, and Gregory E. Phillips

- 533 Will Molasses or Conditioning Increase Consumption of Spotted Knapweed by Sheep? by Travis R. Whitney and Bret E. Olson

- 538 Influence of Fire on Black-Tailed Prairie Dog Colony Expansion in Shortgrass Steppe by David J. Augustine, Jack F. Cully, Jr., and Tammi L. Johnson

- 543 Extent of Stem Dieback in Trembling Aspen (*Populus tremuloides*) as an Indicator of Time-Since Simulated Browsing by Allan W. Carson, Roy V. Rea, and Arthur L. Fredeen

*Technical Note*

- 548 Digital Photography: Reduced Investigator Variation in Visual Obstruction Measurements for Southern Tallgrass Prairie by Ryan F. Limb, Karen R. Hickman, David M. Engle, Jack E. Norland, and Samuel D. Fuhlendorf

*Forum*

- 553 Saltcedar Water Use: Realistic and Unrealistic Expectations by M. Keith Owens and Georgianne W. Moore

NOVEMBER 2007

*Research Articles*

- 559 Chukar Watering Patterns and Water Site Selection by Randy T. Larsen, Jerran T. Flinders, Dean L. Mitchell, Ernest R. Perkins, and David G. Whiting

- 566 Initial Effects of Brush Cutting and Shoot Removal on Willow Browse Quality by Roy V. Rea and Michael P. Gillingham

- 574 The Potential for Horses to Disperse Alien Plants Along Recreational Trails by Floye H. Wells and William K. Lauenroth

- 578 Effects of Weaning Date and Prepartum Protein Supplementation on Cow Performance and Calf Growth by L. Aaron Stalker, Lane A. Ciminski, Don C. Adams, Terry J. Klopfenstein, and Richard T. Clark

- 588 Effects of Supplementation on Juniper Intake by Goats by Erika S. Campbell, Charles A. Taylor, John W. Walker, Christopher J. Lupton, Dan F. Waldron, and S. Y. Landau

- 596 Effects of Fire and Neighboring Trees on Ashe Juniper by Jill M. Noel and Norma L. Fowler

- 604 Establishment of Native Species in Soils From Russian Knapweed (*Acroptilon repens*) Invasions by Sarah J. Tyrer, Ann L. Hild, Brian A. Mealor, and Larry C. Munn

- 613 Prediction of Cheatgrass Field Germination Potential Using Wet Thermal Accumulation by Bruce A. Roundy, Stuart P. Hardegree, Jeanne C. Chambers, and Alison Whittaker

- 624 Influence of Grassland Gap on Seeding Establishment of *Leymus chinensis* (Trin.) Tzvel. by G. X. Liu and J. G. Han

- 632 The Effects of Residual Debris Disposal on Perennial Grass Emergence, Growth, and Survival in a Ponderosa Pine Ecotone by Darin J. Law and Peter F. Kuhl

- 644 Nutrient Availability in Rangeland Soils: Influence of Prescribed Burning, Herbaceous Vegetation Removal, Overseeding with *Bromus tectorum*, Season, and Elevation by R. R. Blank, J. Chambers, B. Roundy, and A. Whittaker

- 656 Effects of Grazing Intensity, Precipitation, and Temperature on Forage Production by Bob D. Patton, Xuejun Dong, Paul E. Nyren, and Anne Nyren

- 666 Hydrologic Impacts of Mechanical Seeding Treatments on Sagebrush Rangelands by Frederick B. Pierson, Wilbert H. Blackburn, and Steven S. Van Vactor

- 675 Salt-Lick-Induced Soil Disturbance in the Teton Wilderness, USA by D. K. Walters and T. H. DeLuca

*Research Notes*

- 680 Livestock Grazing Impacts on Desert Vegetation, Khirthar National Park, Pakistan by Neal J. Enright and Ben P. Miller

- 685 Volume 60 Table of Contents and Index

**Rangeland Ecology & Management**  
**Index**  
**Volume 60, 2007**

**A**

- A Basis for Relative Growth Rate Differences Between Native and Invasive Forb Seedlings, 395  
A Fence Design for Excluding Elk Without Impeding Other Wildlife, 529  
A Method for Landscape-Scale Vegetation Assessment: Application to Great Basin Rangeland Ecosystems, 209  
A Passive Application Watering System for Rangeland Plots, 203  
*Abies grandis*, 172  
Abundance, 186  
Activity, 350  
Adams, Don C., 578  
Aerial photography, 115  
Aerial survey, 408  
Aguilera, Lisa, 71  
*Alectothis chukar*, 559  
Allelopathy, 604  
Amelioration, 417  
Ammonium, 304  
Anderson, Linda, 408  
Anderson, Val Jo, 235  
Ansley, R. James, 154, 244  
Application efficiency, 203  
Application rates, 203  
Aquatic assessment, 293  
Arid lands, 165  
*Artemisia tridentata*, 261  
    subsp. *wyomingensis*, 515, 604  
    *tripartita*, 261  
Arthington, J. D., 12  
Aspen regeneration, 529  
Assal, Timothy J., 45  
Assessment of Expert Opinion: Seasonal Sheep Preference and Plant Response to Grazing, 125  
Association software, 339  
Attitudes, 136  
Augustine, David J., 538  
Australia, 408

**B**

- Bailey, Derek W., 54  
Banks, Jeffrey E., 487  
Bates, Jonathan (Jon) D., 199, 285, 515  
Beef cattle, 12, 172  
Behavior, 533  
Bender, Louis C., 277

- Benning, J. L., 311  
Berrang, Paul C., 99  
Big sagebrush, 613  
Bioindicators, 1, 31  
Biomass, 548  
Black sagebrush, 235  
Blackburn, Wilbert H., 666  
Blackland Tallgrass Prairie Vegetation Dynamics Following Cessation of Herbicide Application, 186  
Black-tailed prairie dogs, 45  
Blank, R. R., 644  
Blue Mountains, 218  
Bluebunch Wheatgrass Response to Spring Defoliation on Foothill Rangeland, 498  
Blumenthal, Dana, 523  
Bock, Carl E., 508  
Bock, Jane H., 508  
Body condition, 487  
Bohlen, Patrick J., 1, 19  
Booth, D. Terrence, 523  
Botanical composition, 172  
*Bouteloua gracilis*, 79  
Bowen ratio, 464  
Boyd, Chad S., 199  
Brangus Cow-Calf Performance Under Two Stocking Levels on Chihuahuan Desert Rangeland, 110  
Brewer, Tracy K., 498  
*Bromus tectorum*, 235  
Brower, Ann, 435  
Brunson, Mark, 136  
Brush management, 154, 244  
Bunchgrass rangelands, 218  
Burn, 508

**C**

- Calicotome villosa*, 453  
Campbell, Erika S., 104, 588  
Campbell, Kenneth L., 1, 19  
Capice, John C., 19  
Carbon dioxide, 464  
Carpinelli, Michael F., 378  
Carson, Allan W., 543  
Castellano, Michael J., 154, 244  
Cattle Grazing Effects on Macroinvertebrates in an Oregon Mountain Stream, 293  
Cattle, 54, 165, 195, 350, 441, 543  
*Cervus elaphus*, 529  
Chambers, J., 644  
Chambers, Jeanne C., 613  
Cheatgrass, 666

- Cheatgrass Invasion in Salt Desert Shrublands: Benefits of Postfire Reclamation, 235  
Chemically defended plants, 191  
Chinese bush clover, 253  
Chukar Watering Patterns and Water Site Selection, 559  
Ciminski, Lane A., 578  
Clark, Richard T., 578  
Climate, 146  
Clipping, 498, 543  
Coleman, S. W., 12  
Collective action problem, 225  
Colorado, 574  
Comer, Patrick J., 324  
Community-based natural resource management, 225  
Competition, 304, 624  
Conflict, 125  
Conley, Julie Lorton, 136  
Conservation biology, 45  
Continuous grazing, 270  
Cooper, Stephen V., 261  
Coronado National Forest, 136  
Costs and Losses Imposed on California Ranchers by Yellow Starthistle, 369  
Cover, 515  
Cow-calf operations, 1  
Cox, Samuel E., 523  
Crop insurance, 359  
Cully, Jack F., Jr., 538  
Cummings, D. Chad, 253  
*Cynomys ludovicianus*, 538

**D**

- Dalea purpurea*, 604  
Dalmatian toadflax, 523  
Data filtering, 350  
Davies, Kirk W., 304, 515  
DeBacker, Michael D., 426  
Decreasing Forage Allowance Can Force Cattle to Graze Broom Snakeweed (*Gutierrezia sarothrae*) as a Potential Biological Control, 487  
Defoliation response, 498  
DelCurto, Timothy, 172  
DeLuca, T. H., 675  
Deregibus, Victor A., 471  
Derner, Justin D., 186, 270  
Desert vegetation, 680  
Detoxification, 588  
Diet  
    botanical composition, 65

- quality, 65, 71, 172  
 selection, 65, 191, 195  
 Diet Composition of Cattle Grazing Sandhills Range During Spring, 65  
 Differences in Food Ingestion and Digestion Among Sheep Classified as High or Low Sagebrush Consumers, 191  
 Differential correction, 350  
 Digestion balance, 191  
 Digital Photography: Reduced Investigator Variation in Visual Obstruction Measurements for Southern Tallgrass Prairie, 548  
 Directionality, 417  
 Disk-chain, 666  
 Distribution, 54  
 Disturbance, 613  
 Disturbance ecology, 253  
 Diterpenoid alkaloids, 441  
 Dong, Xuejun, 656  
 Drenovsky, Rebecca E., 395  
 Drill seeding, 235  
 Drought, 165  
 Dung, 574  
 Dunn, Barry H., 146
- E**  
 Eagle, Alison J., 369  
 Ecological classification standard, 324 condition, 165, 209 site(s), 146, 324  
 Economic performance, 1  
 Ecosystem functioning, 79  
 Ecosystem Water Use Efficiency in a Semiarid Shrubland and Grassland Community, 464  
 Edwards plateau, 596  
 Effect of Phosphate Fertilization on Flooding Pampa Grasslands (Argentina), 471  
 Effects of Cattle Stocking Rates on Nematode Communities in South Florida, 31  
 Effects of Fire and Neighboring Trees on Ashe Juniper, 596  
 Effects of Fire Frequency and Intensity on Velvet Mesquite in an Arizona Grassland, 509  
 Effects of Forage Management on Pasture Productivity and Phosphorus Content, 311  
 Effects of Grazing Intensity, Precipitation, and Temperature on Forage Production, 656  
 Effects of Supplementation on Juniper Intake by Goats, 588  
 Effects of Weaning Date and Prepartum Protein Supplementation on Cow Performance and Calf Growth, 578  
 Effects of Wildlife on Cattle Diets in Laikipia Rangeland, Kenya, 179  
 Eiswerth, Mark E., 369  
 Elk, 498  
 Emergence, 624  
 Emmerich, William E., 464  
 Endozoochory, 574  
 Endress, Bryan A., 218  
 Engle, David M., 253, 548  
 Enright, Neal J., 680
- Erosion, 666  
 Establishment of Native Species in Soils From Russian Knapweed (*Acroptilon repens*) Invasions, 604  
 Estimating plant biomass, 447  
 Eutrophication, 19  
 Evaluation of Low-Moisture Blocks and Conventional Dry Mixes for Supplementing Minerals and Modifying Cattle Grazing Patterns, 54  
 Evapotranspiration, 464  
 Evenness, 186  
 EWUE, 464  
 Exclosure(s), 529, 680  
 Exotic grasslands, 508  
 Exotic weed, 604  
 Extent of Stem Dieback in Trembling Aspen (*Populus tremuloides*) as an Indicator of Time-Since Simulated Browsing, 543
- F**  
 Facilitation, 417, 596  
 Feagin, Rusty A., 417  
 Feed blocks, 54  
 Fernandez-Gimenez, Maria E., 136, 225  
 Ferrier, Cara E., 523  
 Fire, 154, 453, 515, 613, 632 behavior, 244 ecology, 253 effects, 261 survival, 596  
 Fisher, Justin W., 529  
 Fisheries, 293  
 Flinders, Jerran T., 559  
 Foliage volume, 508  
 Forage, 12, 165, 566 productivity, 359, 471 quality, 71, 311 values, 369  
 Foraging behavior, 54  
 Forbis, Tara A., 209  
 Forbs, 179  
 Forest Service Grazing Permittee Perceptions of the Endangered Species Act in Southeastern Arizona, 136  
 Fowler, Norma L., 596  
 Fragmentation, 36  
 Fraker-Marble, M. J., 191  
 Fredeen, Arthur L., 543  
 Fuels, 508  
 Fuhlendorf, Samuel D., 253, 548  
 Functional groups, 186
- G**  
*Gaillardia aristata*, 604  
 Game management, 675  
 Gamma distribution, 447  
 Ganskopp, Dave, 71  
 Ganskopp, David C., 350  
 Gap Analysis Program, 324  
 Gap size, 624
- Gardner, Dale R., 441  
 Gates, Roger N., 146  
 George, Melvin R., 339  
 Germination, 386  
 Gill, Richard A., 88  
 Gillingham, Michael P., 566  
 Glands, 104  
 Global positioning system collars, 350  
 Goats, 104, 195  
 GPS Error in Studies Addressing Animal Movements and Activities, 350  
 Graetz, Donald A., 19  
 Grass(es), 401, 471  
 Grassland(s), 125, 304, 656 birds, 319 disturbance, 538  
 Grazing, 12, 31, 311, 453, 508, 533, 680 behavior, 191, 350 enclosure, 88 fees, 36 management, 1, 71, 253, 498 optimization hypothesis, 656 permits, 435 permit buyout, 36 pressure, 487, 656 system, 270  
 Grazing and Burning Japanese Brome (*Bromus japonicus*) on Mixed Grass Rangelands, 479  
 Grazing Land Reform in New Zealand: Background, Mechanics, and Results, 435  
 Grazing-Induced Modifications to Peak Standing Crop in Northern Mixed-Grass Prairie, 270  
 Greasewood, 235  
 Great Basin, 613  
 Greenline, 293  
 Growth regulator, 319  
 Gulzar, Salman, 401  
 Guzzlers, 559
- H**  
 Haan, M. M., 311  
 Habitat detection, 45 monitoring, 45  
 Habitat Effects on Condition of Doe Mule Deer in Arid Mixed Woodland-Grassland, 277  
 Halophyte, 401  
 Han, J. G., 624  
 Hardegree, Stuart P., 285, 613  
 Harmoney, K. R., 479  
 Harris, Norman R., 339  
 Hart, Richard H., 270  
 Hawkes, Jerry, 110  
 Heat accumulation, 613  
 Heathland, 125  
 Henkin, Zalmen, 453  
 Herbaceous production, 154  
 Herbicide, 453  
 Herbivory, 125, 195, 253, 498, 529  
 Hershner, Mary E., 225

- Heterogeneity, 253  
 Heywood, John S., 426  
 Hickman, Karen R., 186, 548  
 Hild, Ann L., 386, 604  
 Hitchcock, D., 12  
 Holechek, Jerry L., 110, 165  
 Holland, John P., 125  
 Howery, Larry D., 225  
 Human perception, 359  
**Hydrologic Impacts of Mechanical Seeding Treatments on Sagebrush Rangelands**, 666  
**Hydrology**, 88, 285, 666
- I**
- Infiltration, 285, 666  
**Influence of 90 Years of Protection From Grazing on Plant and Soil Processes in the Subalpine of the Wasatch Plateau, USA**, 88  
**Influence of Fire on Black-Tailed Prairie Dog Colony Expansion in Shortgrass Steppe**, 538  
**Influence of Forest Management and Previous Herbivory on Cattle Diets**, 172  
**Influence of Grassland Gap on Seedling Establishment of *Leymus chinensis* (Trin. Tzvel.)**, 624  
**Influence of Plant Functional Group Removal on Inorganic Soil Nitrogen Concentrations in Native Grasslands**, 304  
**Initial Effects of Brush Cutting and Shoot Removal on Willow Browse Quality**, 566  
 Intake, 533  
**Integrated Ecological and Economic Analysis of Ranch Management Systems: An Example From South Central Florida**, 1  
**Integrating Ranch Forage Production, Cattle Performance, and Economics in Ranch Management Systems for Southern Florida**, 12  
 Invasion, 253  
 Invasive, 235  
     plants, 218, 225, 408, 574  
     weeds, 369, 378  
     weed economics, 369  
**Is Altering Grazing Selectivity of Invasive Forage Species With Patch Burning More Effective Than Herbicide Treatments?**, 253  
 Itano, Shiro, 447
- J**
- Jacobo, Elizabeth J., 471  
 James, Jeremy J., 304, 395  
 Jessop, Brad D., 235  
 Johnson, Douglas E., 339  
 Johnson, Dustin D., 350  
 Johnson, G. R., 99  
 Johnson, Patricia S., 146  
 Johnson, Tammi L., 538  
 Johnson, Wayne S., 369  
 Jones, Gina, 209  
 Jones, Zach F., 508  
*Juniperus*, 588
- K**
- Kamienski, Thomas, 277  
 Karachi, 401  
 Kastens, Jude H., 359  
 Kennedy, Linda, 508  
**Key Attributes Influence the Performance of Local Weed Management Programs in the Southwest United States**, 225  
 Khan, M. A., 401  
 Khumalo, Godfrey, 110, 165  
 Kinter, Cecilia Lynn, 386  
 Klopfenstein, Terry J., 578  
 Knowledge, 125  
 Koehler, Ann E., 203  
 Kolb, Peter F., 632  
 Kovar, J. L., 311  
*Krascheninnikovia lanata*, 604  
 Kronberg, Scott L., 195  
 Kudray, Greg, 261
- L**
- Land cover mapping, 324  
 Land reform, 435  
 Landau, S. Y., 588  
 Landowner attitudes, 36  
 Landscape dynamics, 115  
 Landscape ecology, 209, 218  
**Landscape Factors Influencing the Abundance and Dominance of the Invasive Plant *Potentilla recta***, 218  
**Large-Scale Aerial Images Capture Details of Invasive Plant Populations**, 523  
 Larkspur, 441  
 Larsen, Randy T., 559  
 Lauenroth, William K., 574  
 Launchbaugh, K. L., 191  
 Lavelle, Michael J., 529  
 Law, Darin J., 632  
**Learning Through Foraging Consequences: A Mechanism of Feeding Niche Separation in Sympatric Ruminants**, 195  
 Legg, Colin J., 125  
 Lesica, Peter, 261  
 Light, 401  
 Lightweight aircraft, 523  
 Limb, Ryan F., 548  
*Litharia dalmatica*, 523  
 Lingua, Emanuele, 115  
 Liu, G. X., 624  
 Liu, Xiaojing, 401  
**Livestock Forage Conditioning Among Six Northern Great Basin Grasses**, 71  
**Livestock Grazing Impacts on Desert Vegetation, Khirthar National Park, Pakistan**, 680  
 Livestock, 179, 508  
     management, 293  
 Lockwood, Jeffrey A., 45
- M**
- Macro-ecology, 253  
 Mangold, Jane M., 378  
 Mapping, 408  
**Mapping Mesquite (*Prosopis*) Distribution and Density Using Visual Aerial Surveys**, 408  
 Martinez, F. Martin Huerta, 79  
 McDougald, Neil K., 339  
 McInnis, Michael L., 293  
 McIver, James D., 293  
 McSorley, Robert, 31  
 Mealor, Brian A., 386, 604  
 Medina-Roldán, Eduardo, 79  
 Mediterranean, 453  
 Medlyn, Gary, 209  
 Megaherbivores, 179  
 Meristem, 543  
 Method, 350  
 Methyllycaconitine, 441  
 Miller, Ben P., 680  
 Miller, Richard (Rick) F., 199, 515  
 Mineralizable carbon, 88  
 Mitchell, Dean L., 559  
 Molinar, Francisco, 165  
 Monitoring, 209, 523  
     costs, 408  
 Monoterpene, 588  
**Monoterpene Production in Redberry Juniper Foliage Following Fire**, 104  
 Moore, Georgianne W., 553  
 Moose, 543, 566  
 Moreno, J. Tulio Arredondo, 79  
 Mosley, Jeffrey C., 498  
 Mountain meadow, 293  
 Mowing, 319  
 Moya, Edmundo Garcia, 79  
 Muchovej, R. M., 12  
 Mullahey, J. J., 12  
 Munn, Larry C., 604
- N**
- Naylor, Bridgett J., 218  
 NDVI, 359  
 Nearest neighbor, 339  
 Net primary production, 656  
 New Zealand, 435  
 Nitrate, 304  
 Noel, Jill M., 596  
 Nonnative species, 369  
 Nontarget organisms, 31  
 Norland, Jack E., 548  
 Northern mixed-grass prairie, 656

- Noxious weeds, 218  
 Noy-Meir, Imanuel, 453  
 Number of Samples Required for Estimating Herbaceous Biomass, 447  
 Nutrient(s), 395  
     availability, 644  
     loading, 19  
     supplement, 487  
 Nutrient Availability in Rangeland Soils:  
     Influence of Prescribed Burning,  
     Herbaceous Vegetation Removal,  
     Overseeding with *Bromus tectorum*,  
     Season, and Elevation, 644  
 Nutrition, 71, 179  
 Nyren, Anne, 656  
 Nyren, Paul E., 656

## O

- Odadi, Wilfred O., 179  
 Okeyo-Owuor, J. B., 179  
 Olson, Bret E., 533  
 Open savanna ecosystem, 632  
 Optimal Sampling Designs for Monitoring Plant Frequency, 426  
 Oregon, 218  
 Organic matter, 604  
 Overcompensation, 498  
 Owens, M. Keith, 553

## P

- Parks, Catherine G., 218  
 Parr, Rob, 408  
 Pastures, 31  
 Patton, Bob D., 656  
 Perier, Kenneth M., 19  
 Perkins, Ernest R., 559  
 Pfister, James A., 441  
 Phenology, 359  
 Phillips, Gregory E., 529  
 Phosphorus, 1, 471  
     runoff, 19  
 Pierson, Frederick B., 285, 666  
 Pillai, Rekha B., 115  
*Pinus ponderosa*, 172  
 Plant density, 426  
 Plant response, 543, 566  
 Plot irrigation, 203  
 Plot size, 426  
 Point pattern analysis, 417  
 Poisonous plant(s), 441, 487  
 Pokorny, Monica L., 304  
 Policy, 435  
 Pollock, Meg L., 125  
 Portability, 203  
 Postfire Invasion Potential of Rush Skeletonweed (*Chondrilla juncea*), 386  
 Potential Outcomes and Consequence of a Proposed Grazing Permit Buyout Program, 36  
 Poulsen, Clare L., 378  
 Powers, W. J., 311

- Prediction of Cheatgrass Field Germination Potential Using Wet Thermal Accumulation, 613  
 Preference index, 65  
 Prescribed burning, 104, 154, 191, 515, 538  
 Prescribed fire, 244  
 Prescribed herbivory, 588  
 Prickly Pear Cactus Responses to Summer and Winter Fires, 244  
 Prince, Kevin P., 359  
 Production drivers, 146  
 Production, 146, 515  
 Productivity, 179  
 Property rights, 435  
 Provencher, Louis, 209  
 Public lands, 435  
     grazing, 36, 136  
*Purshia tridentata*, 99

## Q

- Qualitative interviews, 36

## R

- Radosevich, Steven R., 218  
 Ralphs, Michael H., 487  
 Ranch management, 31  
 Random sampling, 447  
 Rangeland  
     drill, 666  
     insurance, 359  
     restoration, 244  
     soils, 644  
 Ranked set sampling, 447  
 Rea, Roy V., 543, 566  
 Recovery, 401  
 Recovery of Big Sagebrush Following Fire in Southwest Montana, 261  
 Reece, Patrick E., 65, 203  
 Reference condition, 209  
 Rehabilitation, 235  
 Remote sensing, 408, 523  
 Remote Sensing and the Rancher: Linking Rancher Perception and Remote Sensing, 359  
 Removal experiment, 304  
 Resin capsules, 644  
 Resource availability, 515  
 Restoration, 624, 632  
 Revegetating Russian Knapweed (*Acroptilon repens*) Infestations Using Morphologically Diverse Species and Seedbed Preparation, 378  
 Richness, 31  
 Riparian livestock grazing, 293  
 Ripley's K, 417  
 Robinson, Todd P., 408  
 Rocky Mountains, 574  
 Rodriguez, Adriana M., 471  
 Roka, F. M., 12  
 Root length density, 311  
 Rotational stocking, 311  
 Roundy, B., 644  
 Roundy, Bruce A., 613

- Rowley, Rex J., 359  
 Runoff and Erosion After Cutting Western Juniper, 285  
 Russell, J. R., 311  
 Ruyle, George B., 136

## S

- Sagebrush obligate, 199  
 Sagebrush semidesert, 209  
 Sagebrush steppe, 386  
 Sagebrush, 261, 285  
 Sage-grouse, 199  
 Salinization, 675  
*Salix scouleriana*, 566  
 Saltcedar Water Use: Realistic and Unrealistic Expectations, 553  
 Salting, 675  
 Salt-Lick-Induced Soil Disturbance in the Teton Wilderness, USA, 675  
 Sampling density, 447  
 Sampling variation, 548  
 Sand dunes, 417  
*Sarcopoterium spinosum*, 453  
 Satellite imagery, 45  
 Scardaoni, Pablo, 471  
 Schacht, Walter H., 65, 203  
 Schmidt, Lisa R., 498  
 Schoenig, Steve E., 369  
 Schulz, Keith A., 324  
 Seamans, Thomas W., 319  
 Seasonal fires, 244  
 Seasonal nutrient use, 304  
 Secondary invasion, 386  
 Security cover, 559  
 Seed  
     bank, 386  
     collection, 99  
     maturation, 99  
 Seed Germination Strategies of *Desmostachya bipinnata*: A Fodder Crop for Saline Soils, 401  
 Seed Shatter Dates of Antelope Bitterbrush in Oregon, 99  
 Seedbed, 632  
     preparation, 378  
 Seedling(s), 574  
     dispersal, 574  
     emergence, 386  
     establishment, 378  
     growth, 624  
 Seeds, 574  
 Seligman, No'am G., 453  
 Semiarid grassland, 79  
 Semiarid rangeland, 538  
 Sericea lespedeza, 253  
 Seward, Nathan W., 529  
 Shannon species diversity, 186  
 Shaw, Nancy L., 386  
 Sheep, 195  
 Sheley, Roger L., 304  
 Shepherd, Damian, 408  
 Shiomi, Masae, 447  
 Short-duration grazing, 270

- S**
- Short-Term Effects of Burning Wyoming Big Sagebrush Steppe in Southeast Oregon, 515
  - Silviculture, 566
  - Smart, Alexander J., 146
  - Soaker hoses, 203
  - Social Associations and Dominance of Individuals in Small Herds of Cattle, 339
  - Social structure, 339
  - Soil
    - carbon, 88
    - degradation, 675
    - hydraulics, 79
    - nutrients, 304
    - temperature, 613
    - water, 613
  - Soil Phosphorus, Cattle Stocking Rates, and Water Quality in Subtropical Pastures in Florida, USA, 19
  - Soil Water Content Dynamics Along a Range Condition Gradient in a Shortgrass Steppe, 79
  - Sørenson's similarity index, 186
  - Spatial
    - analysis, 115, 417
    - distribution, 339
    - heterogeneity, 447
    - structure, 426
    - succession, 417
  - Spatial Patterns of Pinyon-Juniper Woodland Expansion in Central Nevada, 115
  - Species richness, 186, 680
  - Specific leaf area, 395
  - Spring precipitation, 270
  - Stalker, L. Aaron, 578
  - Standardized Ecological Classification for Mesoscale Mapping in the Southwestern United States, 324
  - Statistical power, 426
  - Steinbach, Mark S., 36
  - Steinman, Alan D., 1
  - Stem necrosis, 543
  - Stocking density, 1, 12
  - Stocking rate, 1, 165, 270, 656
  - Streambank stability, 293
  - Subalpine rangeland, 88
  - Succession, 261
  - Successional Transitions and Management of a Phosphorus-Limited Shrubland Ecosystem, 453
  - Summer fire, 154
  - Supplement, 54
  - Survey, 136
  - Survival rates, 596
  - Svejcar, Tony J., 285
  - Swain, Hilary M., 1
- T**
- Tall fescue, 471
  - Tanner, George W., 31
  - Taylor, C. A., Jr., 104
- Taylor, Charles A.**, 588
- Technique(s)**, 350, 548
- Telemetry**, 54
- Temperate native grasslands**, 471
- Temperature**, 401
- Terpenes**, 104
- Terrestrial ecological systems**, 324
- Texas**, 596
- Texas Wintergrass and Buffalograss Response to Seasonal Fires and Clipping**, 154
- The Effects of Forest Residual Debris Disposal on Perennial Grass Emergence, Growth, and Survival in a Ponderosa Pine Ecotone**, 632
- The Influence of Gap Size on Sagebrush Cover Estimates With the Use of Line Intercept Technique**, 199
- The Potential for Horses to Disperse Alien Plants Along Recreational Trails**, 574
- The Spatial Patterns of Functional Groups and Successional Direction in a Coastal Dune Community**, 417
- Theobald, Chris M.**, 125
- Thermal-germination models**, 613
- Thomas, Jack Ward**, 36
- Thomas, Milt**, 110, 165
- Thompson, Julie**, 209
- Thresholds**, 209
- Topography**, 115
- Toxic Alkaloid Concentrations in *Delphinium nuttallianum*, *Delphinium andersonii*, and *Delphinium geyeri* in the Intermountain Region**, 441
- Tree invasion**, 115
- Trophic structure**, 31
- Tsutsumi, Michio**, 447
- Turner, Lee**, 209
- Tyler, Sarah J.**, 604
- U**
- Uncertainty**, 125
  - Ungulate**, 566
  - Using Weather Data to Explain Herbage Yield on Three Great Plains Plant Communities**, 146
  - Utilizing Remote Sensing and GIS to Detect Prairie Dog Colonies**, 45
- V**
- van Klinken, Rieks D.**, 408
  - van Kooten, G. Cornelis**, 369
  - Van Vactor, Steven S.**, 666
  - Vaughn, Timothy J.**, 65
  - Vavra, Martin (Marty)**, 71, 172
  - Vegetation**
    - cover, 680
    - dynamics, 209
- W**
- Walburger, Kenric J.**, 172
  - Waldron, Dan F.**, 588
  - Walker, J. W.**, 191
  - Walker, John W.**, 195, 588
  - Walters, D. K.**, 675
  - Washburn, Brian E.**, 319
  - Water developments**, 559
  - Water quality**, 1
  - Weed(s)**, 395
    - control, 378
    - invasion, 613
  - Weisberg, Peter J.**, 115
  - Welling, G. Robert**, 54
  - Wells, Floye H.**, 574
  - Whisenhunt, W. Douglas**, 203
  - White-tailed deer**, 319
  - Whiting, David G.**, 559
  - Whitney, Travis R.**, 533
  - Whittaker, A.**, 644
  - Whittaker, Alison**, 613
  - Wiedmeier, Randy D.**, 487
  - Wild herbivores**, 179
  - Wilderness**, 675
  - Wildfire**, 538
  - Wildlands**, 574
  - Wildlife damage management**, 529
  - Wildlife habitat**, 71, 199, 548
  - Wildlife Responses to Vegetation Height Management in Cool-Season Grasslands**, 319
  - Will Molasses or Conditioning Increase Consumption of Spotted Knapweed by Sheep?**, 533
  - Woody debris disposal**, 632
  - Woody plant encroachment(s)**, 154, 244
  - Wu, X. Ben**, 417
- X**
- Xu, Lan**, 146
- Y**
- Yarrow**, 395
  - Young, Truman P.**, 179
- Z**
- Zinc toxicity**, 604